Amendments to the Claims

1. (Withdrawn)

2. (Withdrawn)

3. (Withdrawn)

4. (Withdrawn)

5. (Withdrawn)

6. (Withdrawn)

7. (Withdrawn)

8. (Withdrawn)

9. (Withdrawn)

10. (Withdrawn)

11. (Withdrawn)

12. (Withdrawn)

13. (Withdrawn)

14. (Withdrawn)

15. (Withdrawn)

16. (Withdrawn)

17. (Withdrawn)

18. (Withdrawn)

19. (Withdrawn)

20. (Withdrawn)

21. (Withdrawn)

22. (Withdrawn)

23. (Withdrawn)

24. (Withdrawn)

25. (Withdrawn)

26. (Withdrawn)

27. (Withdrawn)

28. (Withdrawn)

29. (Withdrawn)

30. (Withdrawn)

31. (Withdrawn)

32. (Withdrawn)

33. (Withdrawn)

34. (Withdrawn)

35. (Withdrawn)

36. (Withdrawn)

37. (Withdrawn)

38. (Withdrawn)

39. (Original) A method of using a holographic reticle to characterize an optical system, the method comprising the steps of:

(1) placing the holographic reticle in a path of an optical beam within the optical system;

(2) recording an image produced by the path of the optical beam passing through the holographic reticle; and

(3) analyzing the image to characterize the optical system.

40. (Currently Amended) The method of claim ~~39~~ 60, wherein step (1) further comprises:

configuring ~~placing the holographic reticle in a path of an optical beam within~~ the optical system such that a first plane containing the reticle is positioned obliquely to a second plane where the image is recorded.

41. (Original) The method of claim 40, wherein the holographic reticle has a plurality of feature sets thereon.

42. (Original) The method of claim 41, wherein the plurality of feature sets includes at least one of a periodic pattern and a grating pattern.

43. (Original) The method of claim 40, wherein the second plane is positioned in a volume of space that includes a depth of focus of the optical system.

44. (Original) The method of claim 39, wherein step (2) comprises:

recording the image produced by the path of the optical beam passing through the holographic reticle in a recording medium.

45. (Currently Amended) The method of claim ~~39~~ 61, wherein the recording medium is a photo-sensitive substrate.

46. (Original) The method of claim 39, wherein step (3) comprises:

analyzing the image to extract a feature image shift.

47. (Original) The method of claim 39, wherein step (3) comprises:

analyzing the image in real time using a demodulating device to characterize the optical system.

48. (Original) The method of claim 39, wherein step (3) comprises:

analyzing the image to extract a Zernike aberration.

49. (Currently Amended) ~~The~~ A method of ~~claim 39, wherein step (3) comprises~~ using a holographic reticle to characterize an optical system, the method comprising the steps of:

(1) placing the holographic reticle in a path of an optical beam within the optical system;

(2) recording an image produced by the path of the optical beam passing through the holographic reticle; and

(3) analyzing the image interferometrically to produce an interferogram having one or more tilts and one or more pistons that represent at least one optical parameter of the optical system.

50. (Original) The method of claim 49, further comprising the steps of:

(a) detecting an image shift based on said pistons; and

(b) detecting magnification parameters based on said tilts.

51. (Currently Amended) The method of claim ~~39~~ 50, further comprising the step of:

(c) detecting non-uniform distortion parameters based on said pistons and tilts.

52. (Original) The method of claim 51, wherein said non-uniform distortion parameters are detected as a function of a variation in linewidth.

53. (Original) The method of claim 51, wherein said non-uniform distortion parameters are detected from a non-linear phase front of a chirped grating structure.

54. (Original) The method of claim 39, wherein step (3) comprises:

comparing the image with another recorded image to deconvolve higher order aberrations in the optical system from lower order aberrations.

55. (Original) The method of claim 54, wherein said comparing step further comprises:

determining the relative shift differences due to the different partial coherence conditions of the recorded images.

56. (Original) The method of claim 39, wherein the holographic reticle includes a pattern of linewidths such that each linewidth is an integral multiple of a fundamental linewidth.

57. (Original) The method of claim 56, wherein step (3) comprises:

analyzing the image for relative image shifts at a single interferometric angle.

58. (New) A method of using a holographic reticle to characterize an optical system, the method comprising the steps of:

(1) placing the holographic reticle in a path of an optical beam within the optical system; and

(2) analyzing an image, produced by the path of the optical beam passing through the holographic reticle, in real time using a demodulating device to characterize the optical system.

59. (New) The method of claim 58, further comprising the step of:

(3) recording the image.

60. (New) A method of using a holographic reticle to characterize an optical system, the method comprising the steps of:

(1) placing the holographic reticle in a path of an optical beam within the optical system;

(2) recording an image produced by the path of the optical beam passing through the holographic reticle; and

(3) analyzing the image to characterize the optical system for at least one of field curvature, astigmatism, coma, distortion, telecentricity, spherical aberrations, and variation of coherence.

61. (New) The method of claim 60, wherein step (2) comprises:

recording the image produced by the path of the optical beam passing through the holographic reticle in a recording medium.

62. (New) The method of claim 60, wherein step (3) comprises:

analyzing the image to extract a Zernike aberration.

63. (New) The method of claim 60, wherein step (3) comprises:

comparing the image with another recorded image to deconvolve higher order aberrations in the optical system from lower order aberrations.

64. (New) The method of claim 63, wherein said comparing step further comprises:

determining the relative shift differences due to the different partial coherence conditions of the recorded images.